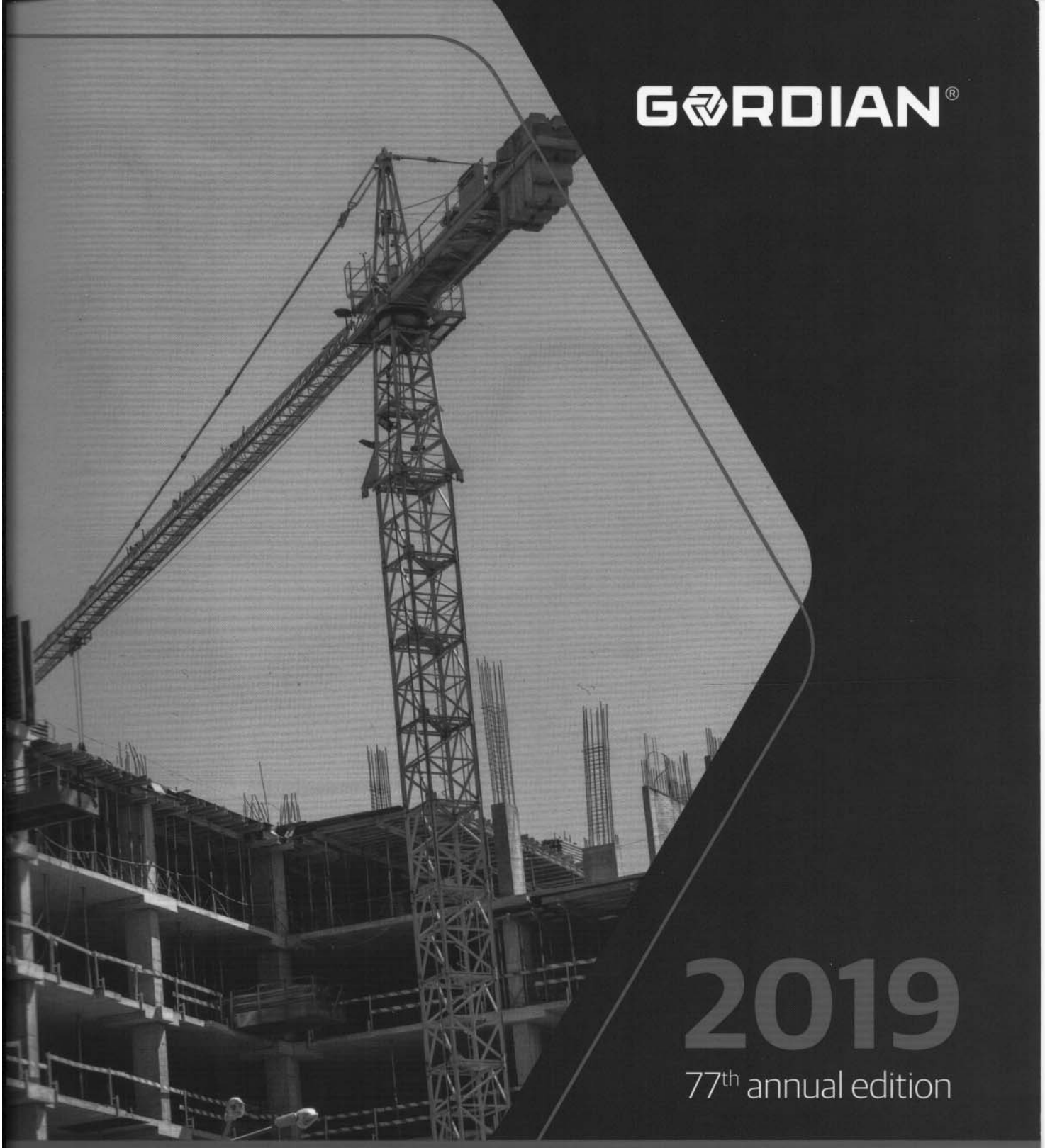

GORDIAN®

2019

77th annual edition

Building Construction Costs
with RSMeans data

Estimating Tips

05 05 00 Common Work Results for Metals

- Nuts, bolts, washers, connection angles, and plates can add a significant amount to both the tonnage of a structural steel job and the estimated cost. As a rule of thumb, add 10% to the total weight to account for these accessories.
- Type 2 steel construction, commonly referred to as "simple construction," consists generally of field-bolted connections with lateral bracing supplied by other elements of the building, such as masonry walls or x-bracing. The estimator should be aware, however, that shop connections may be accomplished by welding or bolting. The method may be particular to the fabrication shop and may have an impact on the estimated cost.

05 10 00 Structural Steel

- Steel items can be obtained from two sources: a fabrication shop or a metals service center. Fabrication shops can fabricate items under more controlled conditions than crews in the field can. They are also more efficient and can produce items more economically. Metal service centers serve as a source of long mill shapes to both fabrication shops and contractors.
- Most line items in this structural steel subdivision, and most items in 05 50 00 Metal Fabrications, are indicated as being shop fabricated. The bare material cost for these shop fabricated items is the "Invoice Cost" from the shop and includes the mill base price of steel plus mill extras, transportation to the shop, shop drawings and detailing where warranted, shop fabrication and handling, sandblasting and a shop coat of primer paint, all necessary structural bolts, and delivery to the job site. The bare labor cost and bare equipment cost for these shop fabricated items are for field installation or erection.
- Line items in Subdivision 05 12 23.40 Lightweight Framing, and other items scattered in Division 5, are indicated as being field fabricated. The bare material cost for these field fabricated items is the "Invoice Cost" from the metals service center and includes the mill base price of steel plus mill extras, transportation to the metals service center, material handling, and delivery of long lengths of mill shapes to the job site. Material costs for structural bolts and welding rods should be added to the estimate. The bare labor cost and bare equipment cost for these items are for both field fabrication and field installation or erection, and include time for cutting, welding, and drilling in the fabricated metal items. Drilling into concrete and fasteners to fasten field fabricated items to other work is not included and should be added to the estimate.

05 20 00 Steel Joist Framing

- In any given project the total weight of open web steel joists is determined by the loads to be supported and the design. However, economies can be realized in minimizing the amount of labor used to place the joists. This is done by maximizing the joist spacing and therefore minimizing the number of joists required to be installed on the job. Certain spacings and locations may be required by the design, but in other cases maximizing the spacing and keeping it as uniform as possible will keep the costs down.

05 30 00 Steel Decking

- The takeoff and estimating of a metal deck involve more than the area of the floor or roof and the type of deck specified or shown on the drawings. Many different sizes and types of openings may exist. Small openings for individual pipes or conduits may be drilled after the floor/roof is installed, but larger openings may require special deck lengths as well as reinforcing or structural support. The estimator should determine who will be supplying this reinforcing. Additionally, some deck terminations are part of the deck package, such as screed angles and pour stops, and others will be part of the steel contract, such as angles attached to structural members and cast-in-place angles and plates. The estimator must ensure that all pieces are accounted for in the complete estimate.

05 50 00 Metal Fabrications

- The most economical steel stairs are those that use common materials, standard details, and most importantly, a uniform and relatively simple method of field assembly. Commonly available A36/A992 channels and plates are very good choices for the main stringers of the stairs, as are angles and tees for the carrier members. Risers and treads are usually made by specialty shops, and it is most economical to use a typical detail in as many places as possible. The stairs should be pre-assembled and shipped directly to the site. The field connections should be simple and straightforward enough to be accomplished efficiently, and with minimum equipment and labor.

Reference Numbers

Reference numbers are shown at the beginning of some major classifications. These numbers refer to related items in the Reference Section. The reference information may be an estimating procedure, an alternate pricing method, or technical information.

Note: Not all subdivisions listed here necessarily appear. ■

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05 05 Common Work Results for Metals

05 05 23 – Metal Fastenings

	05 05 23.87 Weld Studs		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0700	5-5/16" long	G	E-10	990	.016	Ea.	.65	.92	.35	1.92	2.57
0800	6-1/8" long	G		975	.016		.70	.94	.35	1.99	2.66
0900	8-1/8" long	G		960	.017		.99	.95	.36	2.30	3
1000	5/8" diameter, 2-11/16" long	G		1000	.016		.64	.91	.34	1.89	2.53
1010	4-3/16" long	G		990	.016		.79	.92	.35	2.06	2.72
1100	6-9/16" long	G		975	.016		1.03	.94	.35	2.32	3.01
1200	8-3/16" long	G		960	.017		1.38	.95	.36	2.69	3.43
	05 05 23.90 Welding Rod										
0010	**WELDING ROD**										
0020	Steel, type 6011, 1/8" diam., less than 500#					Lb.	2.34			2.34	2.58
0100	500# to 2,000#						2.11			2.11	2.32
0200	2,000# to 5,000#						1.98			1.98	2.18
0300	5/32" diam., less than 500#						2.43			2.43	2.67
0310	500# to 2,000#						2.19			2.19	2.41
0320	2,000# to 5,000#						2.06			2.06	2.26
0400	3/16" diam., less than 500#						2.35			2.35	2.59
0500	500# to 2,000#						2.12			2.12	2.33
0600	2,000# to 5,000#						1.99			1.99	2.19
0620	Steel, type 6010, 1/8" diam., less than 500#						2.51			2.51	2.76
0630	500# to 2,000#						2.26			2.26	2.49
0640	2,000# to 5,000#						2.12			2.12	2.34
0650	Steel, type 7018 Low Hydrogen, 1/8" diam., less than 500#						2.49			2.49	2.74
0660	500# to 2,000#						2.24			2.24	2.46
0670	2,000# to 5,000#						2.11			2.11	2.32
0700	Steel, type 7024 Jet Weld, 1/8" diam., less than 500#						2.52			2.52	2.77
0710	500# to 2,000#						2.27			2.27	2.50
0720	2,000# to 5,000#						2.13			2.13	2.35
1550	Aluminum, type 4043 TIG, 1/8" diam., less than 10#						5.15			5.15	5.70
1560	10# to 60#						4.65			4.65	5.10
1570	Over 60#						4.37			4.37	4.81
1600	Aluminum, type 5356 TIG, 1/8" diam., less than 10#						5.50			5.50	6.05
1610	10# to 60#						4.94			4.94	5.45
1620	Over 60#						4.64			4.64	5.10
1900	Cast iron, type 8 Nickel, 1/8" diam., less than 500#						22			22	24.50
1910	500# to 1,000#						19.90			19.90	22
1920	Over 1,000#						18.70			18.70	20.50
2000	Stainless steel, type 316/316L, 1/8" diam., less than 500#						7.35			7.35	8.10
2100	500# to 1,000#						6.65			6.65	7.30
2220	Over 1,000#						6.25			6.25	6.85

05 12 Structural Steel Framing

05 12 23 – Structural Steel for Buildings

	05 12 23.05 Canopy Framing										
0010	**CANOPY FRAMING**										
0020	6" and 8" members, shop fabricated	G	E-4	3000	.011	Lb.	1.59	.60	.03	2.22	2.74
	05 12 23.10 Ceiling Supports										
0010	**CEILING SUPPORTS**										
1000	Entrance door/folding partition supports, shop fabricated	G	E-4	60	.533	L.F.	26.50	30	1.59	58.09	79
1100	Linear accelerator door supports	G		14	2.286		120	129	6.85	255.85	345
1200	Lintels or shelf angles, hung, exterior hot dipped galv.	G		267	.120		18.05	6.75	.36	25.16	31

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	05 12 23.10 Ceiling Supports		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
1250	Two coats primer paint instead of galv.	G	E-4	267	.120	L.F.	15.65	6.75	.36	22.76	28.50
1400	Monitor support, ceiling hung, expansion bolted	G		4	8	Ea.	420	450	24	894	1,200
1450	Hung from pre-set inserts	G		6	5.333		450	300	15.95	765.95	995
1600	Motor supports for overhead doors	G		4	8		213	450	24	687	980
1700	Partition support for heavy folding partitions, without pocket	G		24	1.333	L.F.	60	75.50	3.99	139.49	190
1750	Supports at pocket only	G		12	2.667		120	151	7.95	278.95	380
2000	Rolling grilles & fire door supports	G		34	.941		51.50	53	2.81	107.31	145
2100	Spider-leg light supports, expansion bolted to ceiling slab	G		8	4	Ea.	172	226	11.95	409.95	560
2150	Hung from pre-set inserts	G		12	2.667	"	185	151	7.95	343.95	455
2400	Toilet partition support	G		36	.889	L.F.	60	50	2.66	112.66	149
2500	X-ray travel gantry support	G		12	2.667	"	206	151	7.95	364.95	475
	05 12 23.15 Columns, Lightweight										
0010	**COLUMNS, LIGHTWEIGHT**										
1000	Lightweight units (lally), 3-1/2" diameter		E-2	780	.072	L.F.	5.60	3.99	2.18	11.77	14.85
1050	4" diameter		"	900	.062	"	7.95	3.45	1.89	13.29	16.25
5800	Adjustable jack post, 8' maximum height, 2-3/4" diameter	G				Ea.	52.50			52.50	58
5850	4" diameter	G				"	84			84	92.50
	05 12 23.17 Columns, Structural										
0010	**COLUMNS, STRUCTURAL** R051223-10										
0015	Made from recycled materials										
0020	Shop fab'd for 100-ton, 1-2 story project, bolted connections										
0800	Steel, concrete filled, extra strong pipe, 3-1/2" diameter		E-2	660	.085	L.F.	43.50	4.71	2.57	50.78	58
0830	4" diameter			780	.072		48.50	3.99	2.18	54.67	62
0890	5" diameter			1020	.055		58	3.05	1.66	62.71	70
0930	6" diameter			1200	.047		76.50	2.59	1.42	80.51	90
0940	8" diameter			1100	.051		76.50	2.83	1.54	80.87	90.50
1100	For galvanizing, add					Lb.	.25			.25	.28
1300	For web ties, angles, etc., add per added lb.		1 Sswk	945	.008		1.32	.47		1.79	2.21
1500	Steel pipe, extra strong, no concrete, 3" to 5" diameter	G	E-2	16000	.004		1.32	.19	.11	1.62	1.88
1600	6" to 12" diameter	G		14000	.004		1.32	.22	.12	1.66	1.93
1700	Steel pipe, extra strong, no concrete, 3" diameter x 12'-0"	G		60	.933	Ea.	163	52	28.50	243.50	292
1750	4" diameter x 12'-0"	G		58	.966		238	53.50	29.50	321	375
1800	6" diameter x 12'-0"	G		54	1.037		455	57.50	31.50	544	625
1850	8" diameter x 14'-0"	G		50	1.120		805	62	34	901	1,025
1900	10" diameter x 16'-0"	G		48	1.167		1,150	65	35.50	1,250.50	1,425
1950	12" diameter x 18'-0"	G		45	1.244		1,550	69	37.50	1,656.50	1,850
3300	Structural tubing, square, A500GrB, 4" to 6" square, light section	G		11270	.005	Lb.	1.32	.28	.15	1.75	2.05
3600	Heavy section	G		32000	.002	"	1.32	.10	.05	1.47	1.66
4000	Concrete filled, add					L.F.	4.96			4.96	5.45
4500	Structural tubing, square, 4" x 4" x 1/4" x 12'-0"	G	E-2	58	.966	Ea.	218	53.50	29.50	301	355
4550	6" x 6" x 1/4" x 12'-0"	G		54	1.037		355	57.50	31.50	444	520
4600	8" x 8" x 3/8" x 14'-0"	G		50	1.120		775	62	34	871	985
4650	10" x 10" x 1/2" x 16'-0"	G		48	1.167		1,425	65	35.50	1,525.50	1,725
5100	Structural tubing, rect., 5" to 6" wide, light section	G		8000	.007	Lb.	1.32	.39	.21	1.92	2.29
5200	Heavy section	G		12000	.005		1.32	.26	.14	1.72	2.02
5300	7" to 10" wide, light section	G		15000	.004		1.32	.21	.11	1.64	1.90
5400	Heavy section	G		18000	.003		1.32	.17	.09	1.58	1.82
5500	Structural tubing, rect., 5" x 3" x 1/4" x 12'-0"	G		58	.966	Ea.	211	53.50	29.50	294	350
5550	6" x 4" x 5/16" x 12'-0"	G		54	1.037		330	57.50	31.50	419	490
5600	8" x 4" x 3/8" x 12'-0"	G		54	1.037		480	57.50	31.50	569	655
5650	10" x 6" x 3/8" x 14'-0"	G		50	1.120		775	62	34	871	985
5700	12" x 8" x 1/2" x 16'-0"	G		48	1.167		1,425	65	35.50	1,525.50	1,725

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	05 12 23.40 Lightweight Framing		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0464	1" x 1" x 1/8"	G	E-3	135	.178	L.F.	.63	10.05	.71	11.39	17.55
0466	1-1/4" x 1-1/4" x 3/16"	G		115	.209		1.17	11.85	.83	13.85	21
0468	1-1/2" x 1-1/2" x 3/16"	G		100	.240		1.43	13.60	.96	15.99	24
0470	2" x 2" x 1/4"	G		90	.267		2.53	15.10	1.06	18.69	28
0472	2-1/2" x 2-1/2" x 1/4"	G		72	.333		3.25	18.90	1.33	23.48	35
0474	3" x 2" x 3/8"	G		65	.369		4.68	21	1.47	27.15	40.50
0476	3" x 3" x 3/8"	G		57	.421		5.70	24	1.68	31.38	46
0600	Channel framing, field fabricated, 8" and larger	G		500	.048	Lb.	.79	2.72	.19	3.70	5.40
0650	Less than 8" channels	G		335	.072	"	.79	4.06	.29	5.14	7.70
0660	C2 x 1.78	G		115	.209	L.F.	1.41	11.85	.83	14.09	21.50
0662	C3 x 4.1	G		80	.300		3.25	17	1.20	21.45	32
0664	C4 x 5.4	G		66	.364		4.28	20.50	1.45	26.23	39.50
0666	C5 x 6.7	G		57	.421		5.30	24	1.68	30.98	45.50
0668	C6 x 8.2	G		55	.436		6.30	24.50	1.74	32.54	48.50
0670	C7 x 9.8	G		40	.600		7.75	34	2.39	44.14	65
0672	C8 x 11.5	G		36	.667		9.10	38	2.66	49.76	73.50
0710	Structural bar tee, field fabricated, 3/4" x 3/4" x 1/8"	G		160	.150		.44	8.50	.60	9.54	14.70
0712	1" x 1" x 1/8"	G		135	.178		.63	10.05	.71	11.39	17.55
0714	1-1/2" x 1-1/2" x 1/4"	G		114	.211		1.86	11.95	.84	14.65	22
0716	2" x 2" x 1/4"	G		89	.270		2.53	15.30	1.08	18.91	28.50
0718	2-1/2" x 2-1/2" x 3/8"	G		72	.333		4.68	18.90	1.33	24.91	36.50
0720	3" x 3" x 3/8"	G		57	.421		5.70	24	1.68	31.38	46
0730	Structural zee, field fabricated, 1-1/4" x 1-3/4" x 1-3/4"	G		114	.211		.60	11.95	.84	13.39	20.50
0732	2-11/16" x 3" x 2-11/16"	G		114	.211		1.41	11.95	.84	14.20	21.50
0734	3-1/16" x 4" x 3-1/16"	G		133	.180		2.13	10.25	.72	13.10	19.45
0736	3-1/4" x 5" x 3-1/4"	G		133	.180		2.91	10.25	.72	13.88	20.50
0738	3-1/2" x 6" x 3-1/2"	G		160	.150		4.39	8.50	.60	13.49	19.05
0740	Junior beam, field fabricated, 3"	G		80	.300		4.52	17	1.20	22.72	33.50
0742	4"	G		72	.333		6.10	18.90	1.33	26.33	38
0744	5"	G		67	.358		7.95	20.50	1.43	29.88	43
0746	6"	G		62	.387		9.90	22	1.54	33.44	47.50
0748	7"	G		57	.421		12.15	24	1.68	37.83	53
0750	8"	G		53	.453		14.60	25.50	1.81	41.91	59
1000	Continuous slotted channel framing system, shop fab, simple framing	G	2 Sswk	2400	.007	Lb.	4.10	.37		4.47	5.10
1200	Complex framing	G	"	1600	.010		4.63	.56		5.19	6
1300	Cross bracing, rods, shop fabricated, 3/4" diameter	G	E-3	700	.034		1.59	1.94	.14	3.67	4.99
1310	7/8" diameter	G		850	.028		1.59	1.60	.11	3.30	4.41
1320	1" diameter	G		1000	.024		1.59	1.36	.10	3.05	4.02
1330	Angle, 5" x 5" x 3/8"	G		2800	.009		1.59	.49	.03	2.11	2.55
1350	Hanging lintels, shop fabricated	G		850	.028		1.59	1.60	.11	3.30	4.41
1380	Roof frames, shop fabricated, 3'-0" square, 5' span	G	E-2	4200	.013		1.59	.74	.40	2.73	3.34
1400	Tie rod, not upset, 1-1/2" to 4" diameter, with turnbuckle	G	2 Sswk	800	.020		1.72	1.12		2.84	3.68
1420	No turnbuckle	G		700	.023		1.65	1.28		2.93	3.86
1500	Upset, 1-3/4" to 4" diameter, with turnbuckle	G		800	.020		1.72	1.12		2.84	3.68
1520	No turnbuckle	G		700	.023		1.65	1.28		2.93	3.86

05 12 23.45 Lintels

0010	**LINTELS**										
0015	Made from recycled materials										
0020	Plain steel angles, shop fabricated, under 500 lb.	G	1 Bric	550	.015	Lb.	1.02	.74		1.76	2.25
0100	500 to 1,000 lb.	G		640	.013		.99	.64		1.63	2.06
0200	1,000 to 2,000 lb.	G		640	.013		.96	.64		1.60	2.03
0300	2,000 to 4,000 lb.	G		640	.013		.94	.64		1.58	2

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			Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
05 12 23.45 Lintels											
0500	For built-up angles and plates, add to above	G				Lb.	1.32			1.32	1.45
0700	For engineering, add to above						.13			.13	.15
0900	For galvanizing, add to above, under 500 lb.						.31			.31	.34
0950	500 to 2,000 lb.						.28			.28	.31
1000	Over 2,000 lb.						.25			.25	.28
2000	Steel angles, 3-1/2" x 3", 1/4" thick, 2'-6" long	G	1 Bric	47	.170	Ea.	14.25	8.70		22.95	29
2100	4'-6" long	G		26	.308		25.50	15.70		41.20	52.50
2600	4" x 3-1/2", 1/4" thick, 5'-0" long	G		21	.381		33	19.45		52.45	65.50
2700	9'-0" long	G		12	.667		59	34		93	117
05 12 23.60 Pipe Support Framing											
0010	**PIPE SUPPORT FRAMING**										
0020	Under 10#/L.F., shop fabricated	G	E-4	3900	.008	Lb.	1.77	.46	.02	2.25	2.72
0200	10.1 to 15#/L.F.	G		4300	.007		1.74	.42	.02	2.18	2.61
0400	15.1 to 20#/L.F.	G		4800	.007		1.72	.38	.02	2.12	2.51
0600	Over 20#/L.F.	G		5400	.006		1.69	.34	.02	2.05	2.41
05 12 23.65 Plates											
0010	**PLATES**	R051223-80									
0015	Made from recycled materials										
0020	For connections & stiffener plates, shop fabricated										
0050	1/8" thick (5.1 lb./S.F.)	G				S.F.	6.75			6.75	7.40
0100	1/4" thick (10.2 lb./S.F.)	G					13.50			13.50	14.85
0300	3/8" thick (15.3 lb./S.F.)	G					20			20	22
0400	1/2" thick (20.4 lb./S.F.)	G					27			27	29.50
0450	3/4" thick (30.6 lb./S.F.)	G					40.50			40.50	44.50
0500	1" thick (40.8 lb./S.F.)	G					54			54	59.50
2000	Steel plate, warehouse prices, no shop fabrication										
2100	1/4" thick (10.2 lb./S.F.)	G				S.F.	7.55			7.55	8.30
05 12 23.70 Stressed Skin Steel Roof and Ceiling System											
0010	**STRESSED SKIN STEEL ROOF & CEILING SYSTEM**										
0020	Double panel flat roof, spans to 100'	G	E-2	1150	.049	S.F.	10.55	2.70	1.48	14.73	17.50
0100	Double panel convex roof, spans to 200'	G		960	.058		17.20	3.24	1.77	22.21	26
0200	Double panel arched roof, spans to 300'	G		760	.074		26.50	4.09	2.23	32.82	38
05 12 23.75 Structural Steel Members											
0010	**STRUCTURAL STEEL MEMBERS**	R051223-10									
0015	Made from recycled materials										
0020	Shop fab'd for 100-ton, 1-2 story project, bolted connections										
0100	Beam or girder, W 6 x 9	G	E-2	600	.093	L.F.	13.10	5.20	2.83	21.13	25.50
0120	x 15	G		600	.093		22	5.20	2.83	30.03	35.50
0140	x 20	G		600	.093		29	5.20	2.83	37.03	43.50
0300	W 8 x 10	G		600	.093		14.55	5.20	2.83	22.58	27.50
0320	x 15	G		600	.093		22	5.20	2.83	30.03	35.50
0350	x 21	G		600	.093		30.50	5.20	2.83	38.53	45
0360	x 24	G		550	.102		35	5.65	3.09	43.74	51
0370	x 28	G		550	.102		40.50	5.65	3.09	49.24	57.50
0500	x 31	G		550	.102		45	5.65	3.09	53.74	62
0520	x 35	G		550	.102		51	5.65	3.09	59.74	68.50
0540	x 48	G		550	.102		70	5.65	3.09	78.74	89.50
0600	W 10 x 12	G		600	.093		17.45	5.20	2.83	25.48	30.50
0620	x 15	G		600	.093		22	5.20	2.83	30.03	35.50
0700	x 22	G		600	.093		32	5.20	2.83	40.03	46.50
0720	x 26	G		600	.093		38	5.20	2.83	46.03	53
0740	x 33	G		550	.102		48	5.65	3.09	56.74	65.50

05 12 23.75 Structural Steel Members			Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0900	x 49	G	E-2	550	.102	L.F.	71	5.65	3.09	79.74	91
1100	W 12 x 16	G		880	.064		23.50	3.53	1.93	28.96	33
1300	x 22	G		880	.064		32	3.53	1.93	37.46	42.50
1500	x 26	G		880	.064		38	3.53	1.93	43.46	49
1520	x 35	G		810	.069		51	3.84	2.10	56.94	64.50
1560	x 50	G		750	.075		72.50	4.15	2.26	78.91	89
1580	x 58	G		750	.075		84.50	4.15	2.26	90.91	102
1700	x 72	G		640	.088		105	4.86	2.65	112.51	126
1740	x 87	G		640	.088		126	4.86	2.65	133.51	150
1900	W 14 x 26	G		990	.057		38	3.14	1.72	42.86	48.50
2100	x 30	G		900	.062		43.50	3.45	1.89	48.84	55.50
2300	x 34	G		810	.069		49.50	3.84	2.10	55.44	63
2320	x 43	G		810	.069		62.50	3.84	2.10	68.44	77.50
2340	x 53	G		800	.070		77	3.89	2.12	83.01	93.50
2360	x 74	G		760	.074		108	4.09	2.23	114.32	127
2380	x 90	G		740	.076		131	4.20	2.29	137.49	153
2500	x 120	G		720	.078		174	4.32	2.36	180.68	201
2700	W 16 x 26	G		1000	.056		38	3.11	1.70	42.81	48.50
2900	x 31	G		900	.062		45	3.45	1.89	50.34	57
3100	x 40	G		800	.070		58	3.89	2.12	64.01	72.50
3120	x 50	G		800	.070		72.50	3.89	2.12	78.51	88.50
3140	x 67	G		760	.074		97.50	4.09	2.23	103.82	116
3300	W 18 x 35	G	E-5	960	.083		51	4.66	1.87	57.53	65.50
3500	x 40	G		960	.083		58	4.66	1.87	64.53	73.50
3520	x 46	G		960	.083		67	4.66	1.87	73.53	83
3700	x 50	G		912	.088		72.50	4.90	1.97	79.37	90
3900	x 55	G		912	.088		80	4.90	1.97	86.87	98
3920	x 65	G		900	.089		94.50	4.97	1.99	101.46	114
3940	x 76	G		900	.089		110	4.97	1.99	116.96	132
3960	x 86	G		900	.089		125	4.97	1.99	131.96	148
3980	x 106	G		900	.089		154	4.97	1.99	160.96	180
4100	W 21 x 44	G		1064	.075		64	4.20	1.69	69.89	79
4300	x 50	G		1064	.075		72.50	4.20	1.69	78.39	88.50
4500	x 62	G		1036	.077		90	4.31	1.73	96.04	108
4700	x 68	G		1036	.077		99	4.31	1.73	105.04	118
4720	x 83	G		1000	.080		121	4.47	1.79	127.26	142
4740	x 93	G		1000	.080		135	4.47	1.79	141.26	158
4760	x 101	G		1000	.080		147	4.47	1.79	153.26	171
4780	x 122	G		1000	.080		177	4.47	1.79	183.26	204
4900	W 24 x 55	G		1110	.072		80	4.03	1.62	85.65	96
5100	x 62	G		1110	.072		90	4.03	1.62	95.65	107
5300	x 68	G		1110	.072		99	4.03	1.62	104.65	117
5500	x 76	G		1110	.072		110	4.03	1.62	115.65	130
5700	x 84	G		1080	.074		122	4.14	1.66	127.80	142
5720	x 94	G		1080	.074		137	4.14	1.66	142.80	158
5740	x 104	G		1050	.076		151	4.26	1.71	156.97	175
5760	x 117	G		1050	.076		170	4.26	1.71	175.97	196
5780	x 146	G		1050	.076		212	4.26	1.71	217.97	242
5800	W 27 x 84	G		1190	.067		122	3.76	1.51	127.27	142
5900	x 94	G		1190	.067		137	3.76	1.51	142.27	158
5920	x 114	G		1150	.070		166	3.89	1.56	171.45	190
5940	x 146	G		1150	.070		212	3.89	1.56	217.45	241
5960	x 161	G		1150	.070		234	3.89	1.56	239.45	265

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	05 12 23.75 Structural Steel Members		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
6100	W 30 x 99	G	E-5	1200	.067	L.F.	144	3.72	1.49	149.21	166
6300	x 108	G		1200	.067		157	3.72	1.49	162.21	181
6500	x 116	G		1160	.069		169	3.85	1.55	174.40	194
6520	x 132	G		1160	.069		192	3.85	1.55	197.40	219
6540	x 148	G		1160	.069		215	3.85	1.55	220.40	245
6560	x 173	G		1120	.071		252	3.99	1.60	257.59	285
6580	x 191	G		1120	.071		278	3.99	1.60	283.59	315
6700	W 33 x 118	G		1176	.068		172	3.80	1.53	177.33	197
6900	x 130	G		1134	.071		189	3.94	1.58	194.52	216
7100	x 141	G		1134	.071		205	3.94	1.58	210.52	233
7120	x 169	G		1100	.073		246	4.06	1.63	251.69	278
7140	x 201	G		1100	.073		292	4.06	1.63	297.69	330
7300	W 36 x 135	G		1170	.068		196	3.82	1.53	201.35	224
7500	x 150	G		1170	.068		218	3.82	1.53	223.35	248
7600	x 170	G		1150	.070		247	3.89	1.56	252.45	280
7700	x 194	G		1125	.071		282	3.97	1.59	287.56	320
7900	x 231	G		1125	.071		335	3.97	1.59	340.56	380
7920	x 262	G		1035	.077		380	4.32	1.73	386.05	430
8100	x 302	G		1035	.077		440	4.32	1.73	446.05	495
8490	For projects 75 to 99 tons, add						10%				
8492	50 to 74 tons, add						20%				
8494	25 to 49 tons, add						30%	10%			
8496	10 to 24 tons, add						50%	25%			
8498	2 to 9 tons, add						75%	50%			
8499	Less than 2 tons, add						100%	100%			

	05 12 23.77 Structural Steel Projects										
0010	**STRUCTURAL STEEL PROJECTS** R050516-30										
0015	Made from recycled materials										
0020	Shop fab'd for 100-ton, 1-2 story project, bolted connections										
0200	Apartments, nursing homes, etc., 1 to 2 stories R050523-10	G	E-5	10.30	7.767	Ton	2,650	435	174	3,259	3,775
0300	3 to 6 stories	G	"	10.10	7.921		2,700	445	178	3,323	3,875
0400	7 to 15 stories R051223-10	G	E-6	14.20	9.014		2,750	505	137	3,392	3,975
0500	Over 15 stories	G	"	13.90	9.209		2,850	515	140	3,505	4,125
0700	Offices, hospitals, etc., steel bearing, 1 to 2 stories R051223-20	G	E-5	10.30	7.767		2,650	435	174	3,259	3,775
0800	3 to 6 stories	G	E-6	14.40	8.889		2,700	495	135	3,330	3,900
0900	7 to 15 stories R051223-25	G		14.20	9.014		2,750	505	137	3,392	3,975
1000	Over 15 stories	G		13.90	9.209		2,850	515	140	3,505	4,125
1100	For multi-story masonry wall bearing construction, add R051223-30							30%			
1300	Industrial bldgs., 1 story, beams & girders, steel bearing	G	E-5	12.90	6.202		2,650	345	139	3,134	3,600
1400	Masonry bearing	G	"	10	8		2,650	445	179	3,274	3,800
1500	Industrial bldgs., 1 story, under 10 tons,										
1510	steel from warehouse, trucked	G	E-2	7.50	7.467	Ton	3,175	415	226	3,816	4,400
1600	1 story with roof trusses, steel bearing	G	E-5	10.60	7.547		3,125	420	169	3,714	4,275
1700	Masonry bearing	G	"	8.30	9.639		3,125	540	216	3,881	4,525
1900	Monumental structures, banks, stores, etc., simple connections	G	E-6	13	9.846		2,650	550	150	3,350	3,925
2000	Moment/composite connections	G	"	9	14.222		4,400	795	216	5,411	6,325
2200	Churches, simple connections	G	E-5	11.60	6.897		2,450	385	155	2,990	3,475
2300	Moment/composite connections	G	"	5.20	15.385		3,275	860	345	4,480	5,325
2800	Power stations, fossil fuels, simple connections	G	E-6	11	11.636		2,650	650	177	3,477	4,125
2900	Moment/composite connections	G		5.70	22.456		3,975	1,250	340	5,565	6,700
2950	Nuclear fuels, non-safety steel, simple connections	G		7	18.286		2,650	1,025	278	3,953	4,800
3000	Moment/composite connections	G		5.50	23.273		3,975	1,300	355	5,630	6,800

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	05 12 23.77 Structural Steel Projects		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
3040	Safety steel, simple connections	G	E-6	2.50	51.200	Ton	3,850	2,850	780	7,480	9,600
3070	Moment/composite connections	G		1.50	85.333		5,075	4,750	1,300	11,125	14,500
3100	Roof trusses, simple connections	G	E-5	13	6.154		3,700	345	138	4,183	4,775
3200	Moment/composite connections	G		8.30	9.639		4,500	540	216	5,256	6,050
3210	Schools, simple connections	G		14.50	5.517		2,650	310	124	3,084	3,525
3220	Moment/composite connections	G		8.30	9.639		3,850	540	216	4,606	5,350
3400	Welded construction, simple commercial bldgs., 1 to 2 stories	G	E-7	7.60	10.526		2,700	590	249	3,539	4,175
3500	7 to 15 stories	G	E-9	8.30	15.422		3,125	860	262	4,247	5,075
3700	Welded rigid frame, 1 story, simple connections	G	E-7	15.80	5.063		2,750	283	120	3,153	3,600
3800	Moment/composite connections	G	"	5.50	14.545		3,575	815	345	4,735	5,575
3900	High strength steel mill spec extras:										
3950	A529, A572 (50 ksi) and A36: same as A992 steel (no extra)										
4000	Add to A992 price for A572 (60, 65 ksi)	G				Ton	80.50			80.50	88.50
4300	Column base plates, light, up to 150 lb.	G	2 Sswk	2000	.008	Lb.	1.45	.45		1.90	2.31
4400	Heavy, over 150 lb.	G	E-2	7500	.007	"	1.52	.41	.23	2.16	2.57
4600	Castellated beams, light sections, to 50#/L.F., simple connections	G		10.70	5.234	Ton	2,775	291	159	3,225	3,675
4700	Moment/composite connections	G		7	8		3,050	445	243	3,738	4,300
4900	Heavy sections, over 50 plf, simple connections	G		11.70	4.786		2,900	266	145	3,311	3,775
5000	Moment/composite connections	G		7.80	7.179		3,175	400	218	3,793	4,375
5390	For projects 75 to 99 tons, add						10%				
5392	50 to 74 tons, add						20%				
5394	25 to 49 tons, add						30%	10%			
5396	10 to 24 tons, add						50%	25%			
5398	2 to 9 tons, add						75%	50%			
5399	Less than 2 tons, add						100%	100%			

05 12 23.78 Structural Steel Secondary Members

0010	**STRUCTURAL STEEL SECONDARY MEMBERS**										
0015	Made from recycled materials										
0020	Shop fabricated for 20-ton girt/purlin framing package, materials only										
0100	Girts/purlins, C/Z-shapes, includes clips and bolts										
0110	6" x 2-1/2" x 2-1/2", 16 ga., 3.0 lb./L.F.					L.F.	3.57			3.57	3.93
0115	14 ga., 3.5 lb./L.F.						4.16			4.16	4.58
0120	8" x 2-3/4" x 2-3/4", 16 ga., 3.4 lb./L.F.						4.04			4.04	4.45
0125	14 ga., 4.1 lb./L.F.						4.88			4.88	5.35
0130	12 ga., 5.6 lb./L.F.						6.65			6.65	7.35
0135	10" x 3-1/2" x 3-1/2", 14 ga., 4.7 lb./L.F.						5.60			5.60	6.15
0140	12 ga., 6.7 lb./L.F.						7.95			7.95	8.75
0145	12" x 3-1/2" x 3-1/2", 14 ga., 5.3 lb./L.F.						6.30			6.30	6.95
0150	12 ga., 7.4 lb./L.F.						8.80			8.80	9.70
0200	Eave struts, C-shape, includes clips and bolts										
0210	6" x 4" x 3", 16 ga., 3.1 lb./L.F.					L.F.	3.69			3.69	4.06
0215	14 ga., 3.9 lb./L.F.						4.64			4.64	5.10
0220	8" x 4" x 3", 16 ga., 3.5 lb./L.F.						4.16			4.16	4.58
0225	14 ga., 4.4 lb./L.F.						5.25			5.25	5.75
0230	12 ga., 6.2 lb./L.F.						7.35			7.35	8.10
0235	10" x 5" x 3", 14 ga., 5.2 lb./L.F.						6.20			6.20	6.80
0240	12 ga., 7.3 lb./L.F.						8.70			8.70	9.55
0245	12" x 5" x 4", 14 ga., 6.0 lb./L.F.						7.15			7.15	7.85
0250	12 ga., 8.4 lb./L.F.						10			10	11
0300	Rake/base angle, excludes concrete drilling and expansion anchors										
0310	2" x 2", 14 ga., 1.0 lb./L.F.		2 Sswk	640	.025	L.F.	1.19	1.40		2.59	3.54
0315	3" x 2", 14 ga., 1.3 lb./L.F.			535	.030		1.55	1.68		3.23	4.37

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05 12 Structural Steel Framing

05 12 23 – Structural Steel for Buildings

	05 12 23.78 Structural Steel Secondary Members		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0320	3" x 3", 14 ga., 1.6 lb./L.F.		2 Sswk	500	.032	L.F.	1.90	1.79		3.69	4.95
0325	4" x 3", 14 ga., 1.8 lb./L.F.			480	.033		2.14	1.87		4.01	5.35
0600	Installation of secondary members, erection only										
0610	Girts, purlins, eave struts, 16 ga., 6" deep		E-18	100	.400	Ea.		22.50	8.70	31.20	45
0615	8" deep			80	.500			28	10.85	38.85	56.50
0620	14 ga., 6" deep			80	.500			28	10.85	38.85	56.50
0625	8" deep			65	.615			34.50	13.35	47.85	69
0630	10" deep			55	.727			41	15.80	56.80	82
0635	12" deep			50	.800			45	17.40	62.40	90
0640	12 ga., 8" deep			50	.800			45	17.40	62.40	90
0645	10" deep			45	.889			50	19.30	69.30	100
0650	12" deep			40	1			56	21.50	77.50	113
0900	For less than 20-ton job lots										
0905	For 15 to 19 tons, add					%	10%				
0910	For 10 to 14 tons, add						25%				
0915	For 5 to 9 tons, add						50%	50%	50%		
0920	For 1 to 4 tons, add						75%	75%	75%		
0925	For less than 1 ton, add						100%	100%	100%		

05 12 23.80 Subpurlins

0010	**SUBPURLINS** R051223-50										
0015	Made from recycled materials										
0020	Bulb tees, shop fabricated, painted, 32-5/8" OC, 40 psf L.L.										
0200	Type 218, max 10'-2" span, 3.19 plf, 2-1/8" high x 2-1/8" wide	G	E-1	3100	.008	S.F.	1.71	.43	.03	2.17	2.59
1420	For 24-5/8" spacing, add						33%	33%			
1430	For 48-5/8" spacing, deduct						33%	33%			

05 14 Structural Aluminum Framing

05 14 23 – Non-Exposed Structural Aluminum Framing

05 14 23.05 Aluminum Shapes

0010	**ALUMINUM SHAPES**										
0015	Made from recycled materials										
0020	Structural shapes, 1" to 10" members, under 1 ton	G	E-2	4000	.014	Lb.	3.73	.78	.42	4.93	5.80
0050	1 to 5 tons	G		4300	.013		3.42	.72	.39	4.53	5.30
0100	Over 5 tons	G		4600	.012		3.24	.68	.37	4.29	5.05
0300	Extrusions, over 5 tons, stock shapes	G		1330	.042		3.44	2.34	1.28	7.06	8.85
0400	Custom shapes	G		1330	.042		4.54	2.34	1.28	8.16	10.05

05 15 Wire Rope Assemblies

05 15 16 – Steel Wire Rope Assemblies

05 15 16.05 Accessories for Steel Wire Rope

0010	**ACCESSORIES FOR STEEL WIRE ROPE**										
0015	Made from recycled materials										
1500	Thimbles, heavy duty, 1/4"	G	E-17	160	.100	Ea.	.42	5.70		6.12	9.55
1510	1/2"	G		160	.100		1.84	5.70		7.54	11.15
1520	3/4"	G		105	.152		4.19	8.70		12.89	18.45
1530	1"	G		52	.308		8.35	17.55		25.90	37
1540	1-1/4"	G		38	.421		12.90	24		36.90	52.50
1550	1-1/2"	G		13	1.231		36	70		106	152
1560	1-3/4"	G		8	2		75	114		189	265

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	05 15 16.05 Accessories for Steel Wire Rope		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
1570	2"	G	E-17	6	2.667	Ea.	109	152		261	360
1580	2-1/4"	G		4	4		147	228		375	525
1600	Clips, 1/4" diameter	G		160	.100		1.70	5.70		7.40	10.95
1610	3/8" diameter	G		160	.100		1.87	5.70		7.57	11.15
1620	1/2" diameter	G		160	.100		3	5.70		8.70	12.40
1630	3/4" diameter	G		102	.157		4.87	8.95		13.82	19.60
1640	1" diameter	G		64	.250		8.10	14.25		22.35	31.50
1650	1-1/4" diameter	G		35	.457		13.30	26		39.30	56
1670	1-1/2" diameter	G		26	.615		17.90	35		52.90	75.50
1680	1-3/4" diameter	G		16	1		42	57		99	137
1690	2" diameter	G		12	1.333		46.50	76		122.50	172
1700	2-1/4" diameter	G		10	1.600		68.50	91		159.50	220
1800	Sockets, open swage, 1/4" diameter	G		160	.100		28	5.70		33.70	39.50
1810	1/2" diameter	G		77	.208		40	11.85		51.85	63
1820	3/4" diameter	G		19	.842		62	48		110	145
1830	1" diameter	G		9	1.778		111	101		212	284
1840	1-1/4" diameter	G		5	3.200		154	182		336	460
1850	1-1/2" diameter	G		3	5.333		340	305		645	860
1860	1-3/4" diameter	G		3	5.333		600	305		905	1,150
1870	2" diameter	G		1.50	10.667		910	610		1,520	1,975
1900	Closed swage, 1/4" diameter	G		160	.100		16.70	5.70		22.40	27.50
1910	1/2" diameter	G		104	.154		29	8.75		37.75	46
1920	3/4" diameter	G		32	.500		43.50	28.50		72	93
1930	1" diameter	G		15	1.067		76	61		137	181
1940	1-1/4" diameter	G		7	2.286		114	130		244	335
1950	1-1/2" diameter	G		4	4		207	228		435	590
1960	1-3/4" diameter	G		3	5.333		305	305		610	820
1970	2" diameter	G		2	8		595	455		1,050	1,375
2000	Open spelter, galv., 1/4" diameter	G		160	.100		39.50	5.70		45.20	52.50
2010	1/2" diameter	G		70	.229		41.50	13.05		54.55	66.50
2020	3/4" diameter	G		26	.615		62	35		97	125
2030	1" diameter	G		10	1.600		173	91		264	335
2040	1-1/4" diameter	G		5	3.200		247	182		429	565
2050	1-1/2" diameter	G		4	4		525	228		753	940
2060	1-3/4" diameter	G		2	8		915	455		1,370	1,725
2070	2" diameter	G		1.20	13.333		1,050	760		1,810	2,350
2080	2-1/2" diameter	G		1	16		1,925	910		2,835	3,575
2100	Closed spelter, galv., 1/4" diameter	G		160	.100		33	5.70		38.70	45.50
2110	1/2" diameter	G		88	.182		35	10.35		45.35	55.50
2120	3/4" diameter	G		30	.533		53.50	30.50		84	108
2130	1" diameter	G		13	1.231		114	70		184	237
2140	1-1/4" diameter	G		7	2.286		182	130		312	410
2150	1-1/2" diameter	G		6	2.667		390	152		542	670
2160	1-3/4" diameter	G		2.80	5.714		520	325		845	1,100
2170	2" diameter	G		2	8		645	455		1,100	1,425
2200	Jaw & jaw turnbuckles, 1/4" x 4"	G		160	.100		10.90	5.70		16.60	21
2250	1/2" x 6"	G		96	.167		13.75	9.50		23.25	30.50
2260	1/2" x 9"	G		77	.208		18.35	11.85		30.20	39
2270	1/2" x 12"	G		66	.242		20.50	13.80		34.30	44.50
2300	3/4" x 6"	G		38	.421		27	24		51	68
2310	3/4" x 9"	G		30	.533		30	30.50		60.50	81.50
2320	3/4" x 12"	G		28	.571		38.50	32.50		71	94.50
2330	3/4" x 18"	G		23	.696		46	39.50		85.50	114

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05 15 Wire Rope Assemblies

05 15 16 – Steel Wire Rope Assemblies

	05 15 16.50 Steel Wire Rope		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0870	1-1/4" diameter	G	E-17	230	.070	L.F.	14.40	3.97		18.37	22
0880	1-3/8" diameter	G	↓	192	.083	↓	16.60	4.75		21.35	26
0890	1-1/2" diameter	G	E-18	300	.133	↓	20	7.50	2.90	30.40	37
	05 15 16.60 Galvanized Steel Wire Rope and Accessories										
0010	**GALVANIZED STEEL WIRE ROPE & ACCESSORIES**										
0015	Made from recycled materials										
3000	Aircraft cable, galvanized, 7 x 7 x 1/8"	G	E-17	5000	.003	L.F.	.18	.18		.36	.49
3100	Clamps, 1/8"	G	"	125	.128	Ea.	1.22	7.30		8.52	13
	05 15 16.70 Temporary Cable Safety Railing										
0010	**TEMPORARY CABLE SAFETY RAILING**, Each 100' strand incl.										
0020	2 eyebolts, 1 turnbuckle, 100' cable, 2 thimbles, 6 clips										
0025	Made from recycled materials										
0100	One strand using 1/4" cable & accessories	G	2 Sswk	4	4	C.L.F.	158	224		382	530
0200	1/2" cable & accessories	G	"	2	8	"	340	450		790	1,100

05 21 Steel Joist Framing

05 21 13 – Deep Longspan Steel Joist Framing

	05 21 13.50 Deep Longspan Joists										
0010	**DEEP LONGSPAN JOISTS**										
3010	DLH series, 40-ton job lots, bolted cross bridging, shop primer										
3015	Made from recycled materials										
3040	Spans to 144' (shipped in 2 pieces)	G	E-7	13	6.154	Ton	1,950	345	145	2,440	2,850
3200	52DLH11, 26 lb./L.F.	G		2000	.040	L.F.	24.50	2.23	.94	27.67	31.50
3220	52DLH16, 45 lb./L.F.	G		2000	.040		44	2.23	.94	47.17	53
3240	56DLH11, 26 lb./L.F.	G		2000	.040		25.50	2.23	.94	28.67	32.50
3260	56DLH16, 46 lb./L.F.	G		2000	.040		45	2.23	.94	48.17	54
3280	60DLH12, 29 lb./L.F.	G		2000	.040		28.50	2.23	.94	31.67	36
3300	60DLH17, 52 lb./L.F.	G		2000	.040		51	2.23	.94	54.17	60.50
3320	64DLH12, 31 lb./L.F.	G		2200	.036		30.50	2.03	.86	33.39	37.50
3340	64DLH17, 52 lb./L.F.	G		2200	.036		51	2.03	.86	53.89	60
3360	68DLH13, 37 lb./L.F.	G		2200	.036		36.50	2.03	.86	39.39	44
3380	68DLH18, 61 lb./L.F.	G		2200	.036		60	2.03	.86	62.89	70
3400	72DLH14, 41 lb./L.F.	G		2200	.036		40	2.03	.86	42.89	48
3420	72DLH19, 70 lb./L.F.	G	↓	2200	.036	↓	68.50	2.03	.86	71.39	79.50
3500	For less than 40-ton job lots										
3502	For 30 to 39 tons, add					%	10%				
3504	20 to 29 tons, add						20%				
3506	10 to 19 tons, add						30%				
3507	5 to 9 tons, add						50%	25%			
3508	1 to 4 tons, add						75%	50%			
3509	Less than 1 ton, add					↓	100%	100%			
4010	SLH series, 40-ton job lots, bolted cross bridging, shop primer										
4040	Spans to 200' (shipped in 3 pieces)	G	E-7	13	6.154	Ton	2,025	345	145	2,515	2,925
4200	80SLH15, 40 lb./L.F.	G		1500	.053	L.F.	40.50	2.98	1.26	44.74	50.50
4220	80SLH20, 75 lb./L.F.	G		1500	.053		76	2.98	1.26	80.24	89.50
4240	88SLH16, 46 lb./L.F.	G		1500	.053		46.50	2.98	1.26	50.74	57
4260	88SLH21, 89 lb./L.F.	G		1500	.053		90	2.98	1.26	94.24	105
4280	96SLH17, 52 lb./L.F.	G		1500	.053		52.50	2.98	1.26	56.74	64
4300	96SLH22, 102 lb./L.F.	G		1500	.053		103	2.98	1.26	107.24	120
4320	104SLH18, 59 lb./L.F.	G	↓	1800	.044	↓	59.50	2.48	1.05	63.03	70.50

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05 21 Steel Joist Framing

05 21 13 – Deep Longspan Steel Joist Framing

	05 21 13.50 Deep Longspan Joists		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
4340	104SLH23, 109 lb./L.F.	G	E-7	1800	.044	L.F.	110	2.48	1.05	113.53	126
4360	112SLH19, 67 lb./L.F.	G		1800	.044		68	2.48	1.05	71.53	79.50
4380	112SLH24, 131 lb./L.F.	G		1800	.044		133	2.48	1.05	136.53	151
4400	120SLH20, 77 lb./L.F.	G		1800	.044		78	2.48	1.05	81.53	91
4420	120SLH25, 152 lb./L.F.	G		1800	.044		154	2.48	1.05	157.53	174
6100	For less than 40-ton job lots										
6102	For 30 to 39 tons, add					%	10%				
6104	20 to 29 tons, add						20%				
6106	10 to 19 tons, add						30%				
6107	5 to 9 tons, add						50%	25%			
6108	1 to 4 tons, add						75%	50%			
6109	Less than 1 ton, add						100%	100%			

05 21 16 – Longspan Steel Joist Framing

05 21 16.50 Longspan Joists

0010	**LONGSPAN JOISTS**										
2000	LH series, 40-ton job lots, bolted cross bridging, shop primer										
2015	Made from recycled materials										
2040	Longspan joists, LH series, up to 96'	G	E-7	13	6.154	Ton	1,875	345	145	2,365	2,775
2200	18LH04, 12 lb./L.F.	G		1400	.057	L.F.	11.25	3.19	1.35	15.79	18.95
2220	18LH08, 19 lb./L.F.	G		1400	.057		17.85	3.19	1.35	22.39	26
2240	20LH04, 12 lb./L.F.	G		1400	.057		11.25	3.19	1.35	15.79	18.95
2260	20LH08, 19 lb./L.F.	G		1400	.057		17.85	3.19	1.35	22.39	26
2280	24LH05, 13 lb./L.F.	G		1400	.057		12.20	3.19	1.35	16.74	20
2300	24LH10, 23 lb./L.F.	G		1400	.057		21.50	3.19	1.35	26.04	30.50
2320	28LH06, 16 lb./L.F.	G		1800	.044		15	2.48	1.05	18.53	21.50
2340	28LH11, 25 lb./L.F.	G		1800	.044		23.50	2.48	1.05	27.03	31
2360	32LH08, 17 lb./L.F.	G		1800	.044		15.95	2.48	1.05	19.48	22.50
2380	32LH13, 30 lb./L.F.	G		1800	.044		28	2.48	1.05	31.53	36
2400	36LH09, 21 lb./L.F.	G		1800	.044		19.70	2.48	1.05	23.23	26.50
2420	36LH14, 36 lb./L.F.	G		1800	.044		34	2.48	1.05	37.53	42
2440	40LH10, 21 lb./L.F.	G		2200	.036		19.70	2.03	.86	22.59	25.50
2460	40LH15, 36 lb./L.F.	G		2200	.036		34	2.03	.86	36.89	41
2480	44LH11, 22 lb./L.F.	G		2200	.036		20.50	2.03	.86	23.39	26.50
2500	44LH16, 42 lb./L.F.	G		2200	.036		39.50	2.03	.86	42.39	47.50
2520	48LH11, 22 lb./L.F.	G		2200	.036		20.50	2.03	.86	23.39	26.50
2540	48LH16, 42 lb./L.F.	G		2200	.036		39.50	2.03	.86	42.39	47.50
2600	For less than 40-ton job lots										
2602	For 30 to 39 tons, add					%	10%				
2604	20 to 29 tons, add						20%				
2606	10 to 19 tons, add						30%				
2607	5 to 9 tons, add						50%	25%			
2608	1 to 4 tons, add						75%	50%			
2609	Less than 1 ton, add						100%	100%			
6000	For welded cross bridging, add							30%			

05 21 19 – Open Web Steel Joist Framing

05 21 19.10 Open Web Joists

0010	**OPEN WEB JOISTS**										
0015	Made from recycled materials										
0050	K series, 40-ton lots, horiz. bridging, spans to 30', shop primer	G	E-7	12	6.667	Ton	1,675	370	157	2,202	2,575
0130	8K1, 5.1 lb./L.F.	G		1200	.067	L.F.	4.25	3.72	1.57	9.54	12.30
0140	10K1, 5.0 lb./L.F.	G		1200	.067		4.16	3.72	1.57	9.45	12.20
0160	12K3, 5.7 lb./L.F.	G		1500	.053		4.75	2.98	1.26	8.99	11.30

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05 21 19.10 Open Web Joists			Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0180	14K3, 6.0 lb./L.F.	G	E-7	1500	.053	L.F.	5	2.98	1.26	9.24	11.60
0200	16K3, 6.3 lb./L.F.	G		1800	.044		5.25	2.48	1.05	8.78	10.80
0220	16K6, 8.1 lb./L.F.	G		1800	.044		6.75	2.48	1.05	10.28	12.45
0240	18K5, 7.7 lb./L.F.	G		2000	.040		6.40	2.23	.94	9.57	11.60
0260	18K9, 10.2 lb./L.F.	G		2000	.040		8.50	2.23	.94	11.67	13.90
0440	K series, 30' to 50' spans	G		17	4.706	Ton	1,625	263	111	1,999	2,325
0500	20K5, 8.2 lb./L.F.	G		2000	.040	L.F.	6.70	2.23	.94	9.87	11.90
0520	20K9, 10.8 lb./L.F.	G		2000	.040		8.80	2.23	.94	11.97	14.25
0540	22K5, 8.8 lb./L.F.	G		2000	.040		7.20	2.23	.94	10.37	12.45
0560	22K9, 11.3 lb./L.F.	G		2000	.040		9.25	2.23	.94	12.42	14.70
0580	24K6, 9.7 lb./L.F.	G		2200	.036		7.90	2.03	.86	10.79	12.85
0600	24K10, 13.1 lb./L.F.	G		2200	.036		10.70	2.03	.86	13.59	15.90
0620	26K6, 10.6 lb./L.F.	G		2200	.036		8.65	2.03	.86	11.54	13.65
0640	26K10, 13.8 lb./L.F.	G		2200	.036		11.25	2.03	.86	14.14	16.55
0660	28K8, 12.7 lb./L.F.	G		2400	.033		10.35	1.86	.79	13	15.20
0680	28K12, 17.1 lb./L.F.	G		2400	.033		13.95	1.86	.79	16.60	19.15
0700	30K8, 13.2 lb./L.F.	G		2400	.033		10.80	1.86	.79	13.45	15.65
0720	30K12, 17.6 lb./L.F.	G		2400	.033		14.35	1.86	.79	17	19.60
0800	For less than 40-ton job lots										
0802	For 30 to 39 tons, add					%	10%				
0804	20 to 29 tons, add						20%				
0806	10 to 19 tons, add						30%				
0807	5 to 9 tons, add						50%	25%			
0808	1 to 4 tons, add						75%	50%			
0809	Less than 1 ton, add						100%	100%			
1010	CS series, 40-ton job lots, horizontal bridging, shop primer										
1040	Spans to 30'	G	E-7	12	6.667	Ton	1,725	370	157	2,252	2,625
1100	10CS2, 7.5 lb./L.F.	G		1200	.067	L.F.	6.45	3.72	1.57	11.74	14.70
1120	12CS2, 8.0 lb./L.F.	G		1500	.053		6.85	2.98	1.26	11.09	13.65
1140	14CS2, 8.0 lb./L.F.	G		1500	.053		6.85	2.98	1.26	11.09	13.65
1160	16CS2, 8.5 lb./L.F.	G		1800	.044		7.30	2.48	1.05	10.83	13.05
1180	16CS4, 14.5 lb./L.F.	G		1800	.044		12.45	2.48	1.05	15.98	18.70
1200	18CS2, 9.0 lb./L.F.	G		2000	.040		7.70	2.23	.94	10.87	13.05
1220	18CS4, 15.0 lb./L.F.	G		2000	.040		12.85	2.23	.94	16.02	18.70
1240	20CS2, 9.5 lb./L.F.	G		2000	.040		8.15	2.23	.94	11.32	13.50
1260	20CS4, 16.5 lb./L.F.	G		2000	.040		14.15	2.23	.94	17.32	20
1280	22CS2, 10.0 lb./L.F.	G		2000	.040		8.55	2.23	.94	11.72	14
1300	22CS4, 16.5 lb./L.F.	G		2000	.040		14.15	2.23	.94	17.32	20
1320	24CS2, 10.0 lb./L.F.	G		2200	.036		8.55	2.03	.86	11.44	13.60
1340	24CS4, 16.5 lb./L.F.	G		2200	.036		14.15	2.03	.86	17.04	19.70
1360	26CS2, 10.0 lb./L.F.	G		2200	.036		8.55	2.03	.86	11.44	13.60
1380	26CS4, 16.5 lb./L.F.	G		2200	.036		14.15	2.03	.86	17.04	19.70
1400	28CS2, 10.5 lb./L.F.	G		2400	.033		9	1.86	.79	11.65	13.70
1420	28CS4, 16.5 lb./L.F.	G		2400	.033		14.15	1.86	.79	16.80	19.35
1440	30CS2, 11.0 lb./L.F.	G		2400	.033		9.45	1.86	.79	12.10	14.15
1460	30CS4, 16.5 lb./L.F.	G		2400	.033		14.15	1.86	.79	16.80	19.35
1500	For less than 40-ton job lots										
1502	For 30 to 39 tons, add					%	10%				
1504	20 to 29 tons, add						20%				
1506	10 to 19 tons, add						30%				
1507	5 to 9 tons, add						50%	25%			
1508	1 to 4 tons, add						75%	50%			
1509	Less than 1 ton, add						100%	100%			

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05 21 Steel Joist Framing

05 21 19 – Open Web Steel Joist Framing

	05 21 19.10 Open Web Joists		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
6200	For shop prime paint other than mfrs. standard, add						20%				
6300	For bottom chord extensions, add per chord	G				Ea.	36.50			36.50	40.50
6400	Individual steel bearing plate, 6" x 6" x 1/4" with J-hook	G	1 Bric	160	.050	"	7.95	2.55		10.50	12.60

05 21 23 – Steel Joist Girder Framing

05 21 23.50 Joist Girders

0010	**JOIST GIRDERS**										
0015	Made from recycled materials										
7020	Joist girders, 40-ton job lots, shop primer	G	E-5	13	6.154	Ton	1,675	345	138	2,158	2,525
7100	For less than 40-ton job lots										
7102	For 30 to 39 tons, add					Ton	10%				
7104	20 to 29 tons, add						20%				
7106	10 to 19 tons, add						30%				
7107	5 to 9 tons, add						50%	25%			
7108	1 to 4 tons, add						75%	50%			
7109	Less than 1 ton, add						100%	100%			
8000	Trusses, 40-ton job lots, shop fabricated WT chords, shop primer	G	E-5	11	7.273		5,475	405	163	6,043	6,850
8100	For less than 40-ton job lots										
8102	For 30 to 39 tons, add					Ton	10%				
8104	20 to 29 tons, add						20%				
8106	10 to 19 tons, add						30%				
8107	5 to 9 tons, add						50%	25%			
8108	1 to 4 tons, add						75%	50%			
8109	Less than 1 ton, add						100%	100%			

05 31 Steel Decking

05 31 13 – Steel Floor Decking

05 31 13.50 Floor Decking

0010	**FLOOR DECKING** R053100-10										
0015	Made from recycled materials										
5100	Non-cellular composite decking, galvanized, 1-1/2" deep, 16 ga.	G	E-4	3500	.009	S.F.	4.17	.52	.03	4.72	5.45
5120	18 ga.	G		3650	.009		2.99	.50	.03	3.52	4.10
5140	20 ga.	G		3800	.008		3.05	.48	.03	3.56	4.14
5200	2" deep, 22 ga.	G		3860	.008		2.05	.47	.02	2.54	3.04
5300	20 ga.	G		3600	.009		2.93	.50	.03	3.46	4.05
5400	18 ga.	G		3380	.009		3.11	.54	.03	3.68	4.30
5500	16 ga.	G		3200	.010		4.12	.57	.03	4.72	5.45
5700	3" deep, 22 ga.	G		3200	.010		2.23	.57	.03	2.83	3.39
5800	20 ga.	G		3000	.011		3.22	.60	.03	3.85	4.55
5900	18 ga.	G		2850	.011		3.11	.63	.03	3.77	4.47
6000	16 ga.	G		2700	.012		4.68	.67	.04	5.39	6.25

05 31 23 – Steel Roof Decking

05 31 23.50 Roof Decking

0010	**ROOF DECKING**										
0015	Made from recycled materials										
2100	Open type, 1-1/2" deep, Type B, wide rib, galv., 22 ga., under 50 sq.	G	E-4	4500	.007	S.F.	2.20	.40	.02	2.62	3.08
2200	50-500 squares	G		4900	.007		1.71	.37	.02	2.10	2.49
2400	Over 500 squares	G		5100	.006		1.59	.35	.02	1.96	2.33
2600	20 ga., under 50 squares	G		3865	.008		2.58	.47	.02	3.07	3.61
2650	50-500 squares	G		4170	.008		2.06	.43	.02	2.51	2.99
2700	Over 500 squares	G		4300	.007		1.85	.42	.02	2.29	2.73

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05 31 Steel Decking

05 31 23 – Steel Roof Decking

	05 31 23.50 Roof Decking		Crew	Daily Output	Labor-Hours	Unit	2019 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2900	18 ga., under 50 squares	G	E-4	3800	.008	S.F.	3.31	.48	.03	3.82	4.43
2950	50-500 squares	G		4100	.008		2.65	.44	.02	3.11	3.64
3000	Over 500 squares	G		4300	.007		2.38	.42	.02	2.82	3.31
3050	16 ga., under 50 squares	G		3700	.009		4.47	.49	.03	4.99	5.70
3060	50-500 squares	G		4000	.008		3.57	.45	.02	4.04	4.68
3100	Over 500 squares	G		4200	.008		3.22	.43	.02	3.67	4.26
3200	3" deep, Type N, 22 ga., under 50 squares	G		3600	.009		3.23	.50	.03	3.76	4.38
3250	50-500 squares	G		3800	.008		2.59	.48	.03	3.10	3.63
3260	over 500 squares	G		4000	.008		2.33	.45	.02	2.80	3.31
3300	20 ga., under 50 squares	G		3400	.009		3.48	.53	.03	4.04	4.70
3350	50-500 squares	G		3600	.009		2.78	.50	.03	3.31	3.89
3360	over 500 squares	G		3800	.008		2.50	.48	.03	3.01	3.54
3400	18 ga., under 50 squares	G		3200	.010		4.51	.57	.03	5.11	5.90
3450	50-500 squares	G		3400	.009		3.61	.53	.03	4.17	4.85
3460	over 500 squares	G		3600	.009		3.24	.50	.03	3.77	4.40
3500	16 ga., under 50 squares	G		3000	.011		5.95	.60	.03	6.58	7.55
3550	50-500 squares	G		3200	.010		4.77	.57	.03	5.37	6.20
3560	over 500 squares	G		3400	.009		4.29	.53	.03	4.85	5.60
3700	4-1/2" deep, Type J, 20 ga., over 50 squares	G		2700	.012		3.92	.67	.04	4.63	5.40
3800	18 ga.	G		2460	.013		5.15	.74	.04	5.93	6.85
3900	16 ga.	G		2350	.014		7.20	.77	.04	8.01	9.15
4100	6" deep, Type H, 18 ga., over 50 squares	G		2000	.016		6.60	.90	.05	7.55	8.80
4200	16 ga.	G		1930	.017		7.70	.94	.05	8.69	10.05
4300	14 ga.	G		1860	.017		9.90	.97	.05	10.92	12.50
4500	7-1/2" deep, Type H, 18 ga., over 50 squares	G		1690	.019		7.85	1.07	.06	8.98	10.40
4600	16 ga.	G		1590	.020		9.80	1.14	.06	11	12.70
4700	14 ga.	G		1490	.021		12.20	1.21	.06	13.47	15.45
4800	For painted instead of galvanized, deduct						5%				
5000	For acoustical perforated with fiberglass insulation, add					S.F.	25%				
5100	For type F intermediate rib instead of type B wide rib, add	G					25%				
5150	For type A narrow rib instead of type B wide rib, add	G					25%				

05 31 33 – Steel Form Decking

05 31 33.50 Form Decking

0010	**FORM DECKING**										
0015	Made from recycled materials										
6100	Slab form, steel, 28 ga., 9/16" deep, Type UFS, uncoated	G	E-4	4000	.008	S.F.	1.66	.45	.02	2.13	2.58
6200	Galvanized	G		4000	.008		1.47	.45	.02	1.94	2.37
6220	24 ga., 1" deep, Type UF1X, uncoated	G		3900	.008		1.59	.46	.02	2.07	2.52
6240	Galvanized	G		3900	.008		1.87	.46	.02	2.35	2.83
6300	24 ga., 1-5/16" deep, Type UFX, uncoated	G		3800	.008		1.69	.48	.03	2.20	2.65
6400	Galvanized	G		3800	.008		1.99	.48	.03	2.50	2.98
6500	22 ga., 1-5/16" deep, uncoated	G		3700	.009		2.15	.49	.03	2.67	3.17
6600	Galvanized	G		3700	.009		2.19	.49	.03	2.71	3.22
6700	22 ga., 2" deep, uncoated	G		3600	.009		2.78	.50	.03	3.31	3.89
6800	Galvanized	G		3600	.009		2.73	.50	.03	3.26	3.83
7000	Sheet metal edge closure form, 12" wide with 2 bends, galvanized										
7100	18 ga.	G	E-14	360	.022	L.F.	4.51	1.29	.27	6.07	7.30
7200	16 ga.	G	"	360	.022	"	6.10	1.29	.27	7.66	9.05

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